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Evaluation of biological integration and inflammatory response to blood vessels produced by tissue engineering - experimental model in rabbit

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The cardiovascular disease is the main cause of mortality in the western population and the Peripheral Arterial Disease (PAD) evolves, in large proportion, to the amputation of the affected limb. This study aimed to synthesize blood vessels using scaffolds of rabbit's Inferior Vena Cava (IVC) and test its interaction with the receiver tissue and test inflammatory responses.

Methods: The IVC were obtained from 8 rabbits to decellularization or *in natura* veins. The descellularized veins (DV) were obtained through protocols of decellularization established previously, using sodium dodecyl sulfate 1% (SDS) and mechanical agitation for 2 hours.12 animals were used to the experiment *in vivo* (3 animals in each group), being the product implanted in the interescapular dorsal area of each animal. The established groups are: **Group 1**- *in natura* allogeneic vein; **Group 2-** DV-SDS no cells added; **Group 3-** DV- SDS with $1x10^5$ adipose tissue allogeneic Mesenchymal Stem Cells (MSC) added; **Group 4-** DV-SDS + autologous MSC. The (MSC) of the autologous receptors were collected 21 days before the implant and expanded *in vitro*. The explants were analyzed by histomorphological/immunohistochemistry and the peripheral blood was collected in the pre operatory in 1d, 7d, 14d, 30d and 60 day post operatory to dose the inflammatory and anti-inflammatory interleukins.

Results: IL-10 and PDGF levels were significantly higher in group 4, which also showed neovascularization and large endothelial reconstruction. We may conclude the existence of an inflammatory response to the use of allogeneic grafts, which is lower when associated with autologous MSC.

Keywords: Stem cells; Endothelium; Blood vessels; Veins; Peripheral arterial disease (PAD).